Mastectomy and Immediate Breast Reconstruction for Cancer in the Elderly: A National Cancer Data Base Study

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BACKGROUND: Mastectomy with immediate breast reconstruction (M+IBR) is performed increasingly for breast cancer treatment, but whether this trend extends to the growing number of women diagnosed at age 65 or older is unknown. We studied the effects of age and comorbidities on the use and outcomes of M+IBR.

STUDY DESIGN: Patients undergoing mastectomy for breast cancer were ascertained from the National Cancer Data Base 2004 to 2012. Performance of M+IBR and outcomes were compared by age group (<65 years vs ≥65 years) and other patient and tumor factors.

RESULTS: There were 364,767 patients who underwent mastectomy, of whom 127,501 (35.0%) had IBR. Among M+IBR patients, 10.3% were age 65 or older, including 1.5% who were 75 or older. From 2004 to 2012, M+IBR increased from 6.7% to 18.1% in women 65 or older ($p < 0.001$), paralleling the increase in women less than 65 years (32.9% to 57.3%; $p < 0.001$). Contralateral prophylactic mastectomy rates in M+IBR patients were lower in patients 65 or older (27.4%) than in those less than 65 (45.9%), $p < 0.001$. A Charlson-Deyo score > 0 (any comorbidity) was more frequent in patients 65 or older having mastectomy alone (27.0%) vs M+IBR (18.4 %) ($p < 0.001$). Among M+IBR patients, the Charlson-Deyo score was >0 in 18.4% of patients 65 or older vs 9.8% among patients less than 65 ($p < 0.001$). Thirty-day unplanned readmission rates were higher for older patients: 3.7% vs 2.9% for M+IBR patients 65 or older vs less than 65, respectively, even those with a Charlson-Deyo score = 0, 3.5% vs 2.8% (both $p < 0.001$).

CONCLUSIONS: Rates of M+IBR rates are increasing, with 10% of M+IBR patients now age 65 or older. Higher 30-day unplanned readmission rates in elderly M+IBR patients with or without comorbidities suggest the need to establish criteria for safe M+IBR in these patients. (J Am Coll Surg 2017;224:895–905. © 2017 by the American College of Surgeons. Published by Elsevier Inc. All rights reserved.)

When mastectomy is required or selected for breast cancer treatment, immediate breast reconstruction (IBR) is feasible for many patients and has been shown to reduce psychological morbidity and improve quality of life after mastectomy.[1] Previous reports indicate that mastectomy with immediate breast reconstruction (M+IBR) is performed less frequently in older women for a variety of reasons including chronologic age alone,[2-4] comorbidities thought to preclude reconstructive surgery,[5] a perception bias that older women do not want reconstruction,[5-7] and unequal access to institutions that offer IBR.[8] A recent report using the Nationwide Inpatient Sample found that IBR was unavailable in 51% of hospitals; therefore, IBR was not offered to patients receiving their breast cancer treatment at these hospitals, regardless of patient age.[9] Interestingly, of centers that do offer IBR, a substantial number do not offer breast reconstruction to patients 65 years and older.[8]

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Abbreviations and Acronyms

CPM = contralateral prophylactic mastectomy
IBR = immediate breast reconstruction
M+IBR = mastectomy + immediate breast reconstruction
NCDB = National Cancer Data Base
OR = odds ratio
RR = relative risk

The median age at breast cancer diagnosis is 62 years, and 42.3% of new cases are diagnosed in patients aged 65 and older.[10] In 2016 alone, 104,337 female patients will be diagnosed with breast cancer at or after age 65, and the total number of new cases is projected to increase as the population ages.[10] The average life expectancy of a 65-year-old women is now 86 years, with one-quarter expected to live to age 90, and the proportion of the population age 65 and older is projected to increase by 50 million in the US alone between 2000 and 2050.[11-13] Numerous reports over the past 10 to 15 years have documented a significant increase in IBR for breast cancer patients treated with mastectomy.[14,15] However, there is a paucity of data on M+IBR among patients age 65 and older, who constitute an increasing proportion of newly diagnosed breast cancer patients.[16] Therefore, we were interested in investigating trends in and outcomes of M+IBR in elderly patients, particularly examining the effects of age and comorbidities. These data may inform future individual decision-making and patient counseling as well as larger scale resource allocation and the development of management guidelines.

METHODS

We performed a retrospective cohort study of the National Cancer Data Base (NCDB) participant user file examining women with breast cancer treated with mastectomy with or without IBR from 2004 to 2012. Patients with stage IV disease, inflammatory breast cancer, males, and those in whom it was unknown if IBR was performed were excluded. Among 420,514 patients who were otherwise eligible, 13.3% were excluded because it was unknown whether IBR was performed. The NCDB contains more than 30 million records of individual cancer cases collected by more than 1,500 Commission on Cancer-approved facilities across the US estimated to capture approximately 70% of all newly diagnosed cancers.[17] Analysis using the NCDB participant user file was deemed exempt from review by the Mayo Clinic Institutional Review Board.

Participants were compared by the performance of reconstruction, presence of comorbidities, and age groups (<age 65 vs ≥age 65). Patients age 65 years and older were further divided into 3 groups based on their age at diagnosis (65 to 74, 75 to 79, and ≥80) to evaluate the trend of use of IBR over the study period. Presence of comorbidities was ascertained and categorized by the NCDB as 0, 1, or 2 or more Charlson-Deyo comorbidities. The types of facilities in which patients underwent M+IBR fit into 4 groups, as defined by the NCDB: community cancer program, comprehensive community cancer program, academic/research program, and other specified types of cancer programs. Thirty-day unplanned readmission included patients readmitted to the same hospital within 30 days of discharge if the reasons were either unplanned only or were a combination of unplanned and planned using NCDB definitions.

Outcomes evaluated were rates and trends of IBR, and 30-day unplanned readmission rates. Patients were evaluated by performance of reconstruction, presence of comorbidities, and age group (<age 65 vs ≥age 65) for association with outcomes variables.

Statistical analysis

Tests for linear trends in rate of IBR over time, stratified by age category, were performed using Cochran-Armitage trend tests. Differences in rates of 30-day unplanned readmission were performed using likelihood ratio chi-square tests for univariate analysis and logistic regression to test for an interaction between age category and IBR. Relative risks (RR) with 95% CIs were estimated within strata for the outcomes of 30-day unplanned readmission. Associations of demographic and clinical features with the use of IBR were evaluated in patients age 65 and older and, for comparison, those less than age 65 years, using multivariable logistic regression and summarized as adjusted odd ratios (OR) and 95% CIs. Values of $p < 0.05$ were considered statistically significant. Analysis was performed using SAS version 9.4 (SAS Institute).

RESULTS

Demographics and trend for immediate breast reconstruction

There were 364,767 patients who underwent mastectomy, of whom 127,501 (35.0%) had IBR. Among M+IBR patients, 89.7% were less than age 65 and 10.3% were age 65 or older, including 1.5% who were age 75 and older. Demographic, tumor, and treatment variables are summarized in Table 1.

From 2004 to 2012, M+IBR increased from 23.8% to 45.6% for the entire patient cohort. Performance of M+IBR over time by age strata is shown in Figure 1. For each age strata, the increase in M+IBR from 2004